

AMERICAN SOCIETY OF CIVIL ENGINEERS AND  
R. I. SOCIETY OF PROFESSIONAL ENGINEERS



# New England

THE CRADLE OF  
AMERICA'S INDUSTRIALIZATION

SPEAKER

Antoine Gazda

*R. I. Society of Professional Engineers Inc.  
195 Angell Street, Providence 6, R. I.*



*First 20mm. Oerlikon A. A. Cannon*

*Switzerland 1936*

Mr. Antoine Gazda, experimenting with the first rapid firing 20mm. Oerlikon A.A. Cannon, initiated by him and developed with the Oerlikon Machine Tool Works, Zuerich-Oerlikon, as the "RIGHT ANSWER FOR THE COMING DIVE-BOMBER MENACE."

ANTOINE GAZDA

WEDNESDAY, APRIL 23, 1947, AT 8:00 P. M.

PROVIDENCE ENGINEERING SOCIETY AUDITORIUM

JOINT MEETING

AMERICAN SOCIETY OF CIVIL ENGINEERS

CHARLES A. MAGUIRE, PRESIDENT

AND

R. I. SOCIETY OF PROFESSIONAL ENGINEERS

CHARLES E. BLAIS, PRESIDENT

SPEAKER

ANTOINE GAZDA

SUBJECT

"NEW ENGLAND, THE CRADLE OF  
AMERICA'S INDUSTRIALIZATION"

INTRODUCTION OF MR. ANTOINE GAZDA BY RISPE PRESIDENT CHARLES E. BLAIS, WEDNESDAY, APRIL 23, 1947, AT JOINT MEETING OF RISPE AND ASCE HELD AT PROVIDENCE ENGINEERING SOCIETY AUDITORIUM.

Officers and Members of the Rhode Island Society of Professional Engineers and Officers and Members of the Providence section of the American Society of Civil Engineers, distinguished guests and friends. As you all know this is a joint meeting of the RISPE and the ASCE one of many such meetings that have been held during the course of the current year between the RISPE and other affiliated engineering groups. Under the original joint meeting plan, arrangements provided for the opening of the meeting by the Chairman of the ASCE and the presentation of the distinguished guest speaker by the President of the RISPE. I am sorry to advise that the Chairman was inadvertently called to Washington on urgent business and due to his inability to preside at the opening phase of our interesting program, I have responded to a request made by the officers of the ASCE to pinch hit for him. At the outset, I wish to express my sincere appreciation for the opportunity to serve both Societies in this dual capacity. I deem it an honor and a pleasure to be called upon for the purpose of presenting a distinguished fellow engineer whose fame as an international inventor and industrialist is world wide.

The guest speaker of the evening came to this country from Switzerland early in 1940 for the purpose of manufacturing a most effective defensive weapon to combat the deadly and destructive dive bombing tactics of the Huns. At the outset of his search, he had a good opportunity to appraise New England's capacity for producing this much needed precision built weapon, that was developed in Switzerland in 1936. Accordingly, the Oerlikon Cannon was produced in the United States in vast numbers for the British Admiralty which was in sore need of this new weapon. Following our entry into the War the program of production which started in Rhode Island 18 months before Pearl Harbor had reached a high level of efficiency particularly in Rhode Island where exceptional facilities had been provided for making a supreme contribution for fulfilling the demands of the United States Navy's requirement for a superior war weapon. At this point with your kind permission, I wish to digress slightly to personally express to our guest speaker my sincere and heartfelt thanks for his mighty contribution that so effectly neutralized the dive bombing attacks of our ruthless enemies and hastened the termination of hostilities.

I am especially grateful to our guest speaker because through his efforts the duration of the war was materially shortened and I like many of you who suffered through months of fearful anxiety regarding the fate of our loved ones was once again rewarded by their return to us. It is my firm conviction that when history finally reveals the complete story of the war that our guest speaker will be presented to us as a truly great man whose mighty efforts did so much in so little time to forever efface the threat of our diabolical enemies. In the post war world our guest speaker is diligently employed in producing equip-

ment for peace time needs important among these is the jet-propelled helicopter, he is a strong supporter of this type of flying machine and anticipates its use extensively in a post war world. Although his principal peace time interests are concerned with civilian aviation in which he has had over thirty years experience, he is still engaged in armament research for the U. S. Government. He is a great booster for Rhode Island, his conviction is firm in the belief that the precision mechanics and master craftsmen are found in great numbers within the confines of Rhode Island and herein lies our successful future.

Gentlemen, it is an honor and a privilege to present to you our guest speaker of the evening, a great man, a humanitarian, a great industrialist and a fellow engineer, Antoine Gazda. — Mr. Gazda.

*Lecture given by Mr. Antoine Gazda before the*  
AMERICAN SOCIETY OF CIVIL ENGINEERS AND  
RHODE ISLAND SOCIETY OF PROFESSIONAL ENGINEERS,  
*on April 23, 1947.*

Mr. President, Gentlemen:

It certainly is a great honor for me to be with you tonight, and I was happy to be able to accept Mr. Blais' kind invitation to address this distinguished gathering.

Not being much of a speaker, and my Austrian mother tongue still struggling with my English, I felt a little uncomfortable when Mr. Blais asked me to address you. As a matter of fact, I felt like the Duke of Wellington before the Battle of Waterloo, when he was asked what his chances were and what he thought about his Generals; he answered, "When the enemy is as afraid of my Generals as I am, then I shall win the battle". And he did.

Another problem for me was the subject on which to speak to you.

Being in New England, the cradle of the great American industry, and having myself been connected for a life-time with patents and industry, I decided to talk to you about New England industry, particularly in Rhode Island, where I settled in 1940 to organize a new branch of industry.

You may be interested to know why I chose Rhode Island.

I came to this State in 1940, although this was not my first visit to America. As a matter of fact, I had been here eight times before, each time fascinated anew by the tremendous and exciting strides in ideas and production methods made by America's justly famous engineering talent. I was already very familiar with American mass production — especially in the automotive and aviation industries, in which I had many friends, having previously visited their plants from the East to the West Coast.

When I flew to the United States in May, 1940, a few weeks before the collapse of France, I carried with me all the manufacturing drawings of the 20-mm. Swiss Oerlikon cannon. This new weapon had by then been recognized by the British as the right answer to the dive-bomber, against which they were now engaged in a life-struggle, and it was my intention to organize the production of this cannon in the United States for the British Admiralty. After my

arrival in 1940 I traveled all over the States, renewing my friendships with industrialists, Wall Street bankers and Government officials, and trying to interest them in the manufacture of this weapon, or parts of it, for the British.

To my astonishment, I discovered, during this visit, that this big, highly industrialized country, America, famous for its mass production, as a peace-loving nation had the smallest defense industry, in proportion to its size and resources, that I had ever come across. In fact, for its gun models it was almost entirely dependent upon foreign designs and licenses. Switzerland, the oldest democracy in the world, is also well-known as a peace-loving nation, though a small one, but I found that in America there was not one armament factory organized and equipped in a manner to compare with our Swiss-Oerlikon Works. There were practically no machine-tools to be had for immediate use for armament work. There was only a minimum percentage of toolmakers and skilled workers for armament work. This situation, of course, was not favorable for my program. However, I was not discouraged by all these setbacks, and proceeded with my plan, as I wanted to fulfill the promise I had given to the British Admiralty when I warned them of the collapse of France — that I would ensure delivery of Oerlikon cannons from America. When the unbelievable happened, and France did fall, the Swiss Oerlikon Works were, of course, no longer able to deliver to England, and my purpose was to hasten production here of the 20-mm. Oerlikon AA cannon which the British Fleet now needed so urgently.

I had heard about New England's machine-tool and textile machinery industries. Also, Governor William Vanderbilt of Rhode Island had heard of my presence in this country and of my plans. He sent Mr. William Allen, Chairman of the Industrial Commission of the State of Rhode Island, to New York to invite me for a visit to Providence. This visit soon convinced me of the skill of New England's labor and its adaptability to my plans. A large proportion of the plants and shops in Rhode Island were at that time idle, and my idea was that these would form an excellent basis for the American production of Oerlikon cannons. I made my headquarters with the Rhode Island Industrial Commission, who furnished me with a desk in its offices, and I immediately went to work, with the assistance of the Secretary of the Commission, Mr. Clifton N. Lovenberg, and Mr. Cockrell, consulting engineer of the Commission, to locate production capacity for this cannon in Rhode Island.

Before I left Switzerland, the Swiss Oerlikon Works had shipped a 20-mm. Oerlikon AA cannon, as a prototype to the United States. Unfortunately, this cannon never reached the United States, as it was captured on the boat in Bordeaux by the Germans when they overran France. Nevertheless, I was able to arrange with the British Admiralty to bring another Oerlikon cannon to the United States by destroyer, and when this cannon reached New York I shipped it immediately to Providence. As soon as the Oerlikon arrived here, I contacted General Herbert R. Dean, then in charge of the Rhode Island National Guard, and asked for his assistance. General Dean gave me his full cooperation, and placed at my disposal the State Armory in Cranston, where this Oerlikon cannon was exhibited, under heavy guard, so that interested manufacturers might be able to compare our drawings with the actual parts.

I invited Rhode Island manufacturers to view the cannon and drawings, and discussed their possibilities of manufacturing parts for this cannon. When I realized the favorable potentialities existing in Rhode Island, I instructed one of our Swiss Oerlikon engineers, Mr. Lameraner, whom I had left in London, to come to Providence to assist me in establishing the sub-contracting organization for producing this gun in Rhode Island.

I am happy to say that here in Rhode Island I received a great deal of eager and active co-operation in my plans. However, among other obstacles — which I found particularly in Washington — I had to overcome resistance from Rhode Island sources which had no sympathy with Britain's war, ignoring the possibility of this country's being involved and showing little appreciation of the danger the world was facing in those days. I also had opposition from sources which did not care to see competition in the Rhode Island labor market.

Finally, it was in this little State of Rhode Island that I had the privilege of transforming idle work-shops and textile machinery plants, in the shortest time, into important participants in the foundation of what was to become a gigantic United States armament industry. In spite of the lull existing in those days, it was the traditional fame of New England's industry that brought me to this progressive State of Rhode Island seven years ago.

When Governor J. Howard McGrath took office, he asked a friend of mine to arrange a meeting with me. When I met the young Governor, he complimented me on what I was doing to improve the economic status of the State, and for the Allied war effort,



and urged me to call on him directly in any matters in which he could be of assistance. From that time onwards he was my keenest supporter in all I did for the Allied war effort.

With its traditional industrial spirit, Rhode Island proved equal to the task when, eighteen months before Pearl Harbor, I started there mass production of the now famous 20-mm. Oerlikon AA. cannon for the British Admiralty.

Soon came the terrifying news of the Fall of France, — which I had foretold, which everyone had refused to believe, and which was the reason that brought me to America this time. The Nazi occupation of France made it impossible for Switzerland to continue deliveries to England, and the British Government immediately sent me a hurry-up call to investigate the possibilities of speediest delivery of Oerlikon cannons from America. The British had by now learned by tragic experience of the danger of air-power. They had seen the terror of the dive-bombers, which had devastated Poland and Belgium, and which had sent many of their own ships to the bottom of the sea. No longer did the British ridicule the danger from the air to ships, as they did in 1936, when I developed this Oerlikon cannon model and proposed it as the only defense against the coming dive-bomber.

You will be interested to hear that it had taken me almost three years to convince the British Admiralty of the necessity of this new anti-aircraft defense. During the years 1937, 38 and 39, I had to fight against many skeptical ordnance experts to get this powerful cannon introduced into British Admiralty service. Most of these experts felt that the mighty battleships and destroyers of the Royal Navy could easily cope with any threat from the air, and that they had nothing to fear. Some even relied on their mighty 16-inch cannons. My records of those years show that it took me 238 meetings with the Admiralty officials, during 380 days' stay in England, to accomplish the introduction of this defense which they came to need so desperately.

In my efforts to convince the British Admiralty of their need of this new armament against the coming dive-bomber, I was fortunate in having the support of Lord Louis Mountbatten — then a Commander in the Royal Navy — who was one of the first to recognize the significance of this powerful new defense, and who gave me his unceasing assistance and encouragement. It was he who arranged so many of my important meetings and who accompanied me on my visits to influential officials. Indeed, it was

largely due to Lord Louis Mountbatten's foresight and persistence that the British Admiralty finally accepted the Oerlikon cannon as anti-aircraft defense. He even came to America at the beginning of 1941, and, on the basis of his own battle experiences as Commander of destroyer flotillas, convinced the United States Navy of the fact that the Oerlikon cannon was the best defense against the Axis dive bomber. Throughout those difficult years of struggle, I was indeed grateful to have Lord Louis' support. I am happy to say that during that time there developed between us a real friendship, of which Lord Louis gave ample proof during a temporary period which was for me personally a dark and critical one. Only a few months ago we met again, in happier circumstances, in Switzerland, when now Admiral Viscount Mountbatten of Burma had to interrupt his skiing holiday to obey the order he had just received to assume the difficult task of being the last Viceroy of India.

When America entered the war, little Rhody was ready for Uncle Sam, and was able to shift its Oerlikon cannon production for the British Admiralty to the United States Navy. The Oerlikon cannon was immediately adopted as America's best defense against dive-bombers and Kamikazes. Everything afloat in the Allied Navies — from the humblest fisherman's boat to the mighty "Queen Elizabeth" (which carried eighty Oerlikons) — had to be equipped with 20-mm. Oerlikon AA Cannons. My Rhode Island organization, the American Oerlikon Gazda Corporation, whose mass production was by then in full swing, also had to help to tool up the General Motors and the U.S. Navy Hudson plants, as well as numerous sub-contractors for the speediest manufacture of Oerlikon cannons for the United States Navy.

Now it may be revealed that over 460,000 men and women were employed in making this 20-mm. rapid-firing anti-aircraft cannon in the United States during the war, and on this Oerlikon program alone the U.S. Government spent over \$2,800,000,000. — (two billion eight hundred million dollars). Rhode Island itself produced \$187,000,000's worth of Oerlikon cannons.

These figures show, not only how vital to the war effort this Oerlikon cannon proved to be, but also what an important contribution to that effort was made by Rhode Island industry.

I believe I am not wrong in saying that some of the gentlemen here tonight have contributed a significant share to the production of this cannon in Rhode Island.

As industry is so obviously dependent on invention, and as

many new industrial ideas first saw the light in New England, I should like to say a little about inventions.

Everyone realizes that it is to American inventive genius that the prosperity of this great country is so largely due; the names of some of great American inventors — Edison, Steinmetz, the Wright Brothers, Henry Ford, and others — are a proof of this. The American mode of living, economically and socially, is and always will be influenced by the achievements of inventors and scientists; indeed, the course of the whole world's progress will depend upon the achievements of such men. Unfortunately, those responsible for guiding the world's destiny do not always recognize this. For example, when the San Francisco Conference tried to shape the post-war world — a world of peace — they came to the anachronistic conclusion that the key to a peace-guarantee would be a strong air-force. In so doing they neglected to take the scientists into account, and it was not long afterwards that they were shocked into realization of the power of the scientists. The atomic bomb was released, demonstrating a force whose significance had been entirely disregarded by the United Nations representatives at San Francisco, and on which the nations of the world have still been unable to agree. A new problem has been posed, and its solution will unquestionably be a major factor in the shaping of the world's future, whether for peace or for war.

We know that inventions contribute to progress, and lead to the creation of new employment opportunities, but for an inventor to be successful, those three great characteristics — intelligence, courage and determination are indispensable, as from idea to production is a long and thorny path, and not every inventor has lived to see his brain-child materialize.

As an inventor first of all looks for protection of his invention by a patent, it may be of interest to recall how the early American inventor was protected.

It was under President George Washington that Congress passed an Act, in 1790, for the granting of patents to inventors. The Secretary of State in those days was authorized by the President to perform this office, and it is known that, during the George Washington Administration, Thomas Jefferson, in his capacity as Secretary of State, personally examined and granted many of the petitions for patents. At that time petitions for patents were accompanied by a model of the invention, and not merely by a drawing and a description, as is the case today.

So it was in the year 1790, that the American inventor was first protected by a U.S. patent. With the granting of patents, American inventive genius was encouraged. The year 1790, so important for the American inventor, was also important for the industrialization of America, in which New England has played such a noteworthy part. It was in that year that Samuel Slater started to run his first spinning machine in the Slater Mill in Pawtucket, and by so doing he laid the foundation for the now gigantic American textile industry in this smallest State of the Union.

Only four years later, Jefferson issued a patent for the cotton gin, the machine for separating the seeds from raw cotton, which, in the truest sense of the word, revolutionized the United States.

American industry is still in search of new ideas for production, and before the end of the war, as recently stated by the Commissioner of Patents, industry checked over two and one-half million inventions, patented since 1790.

Some of these inventions, so ingeniously painstakingly and precisely contrived, have been fated to lie dormant for a long time, to be hailed as something new and startling when rediscovered years later. Our old patent for the zipper, for instance, granted in 1893, remained practically unknown to the general public until comparatively recently, and the same is true of many ideas which have contributed to the smooth running of American life and industry.

The helicopters, jets, rockets and other sensational developments, which have revolutionized their spheres in the twentieth century, were invented long, long ago.

Rockets were successfully used by the ancient Chinese thousands of years ago. Jet propulsion, a sensation in the field of modern aviation, was invented by the Alexandrian philosopher, Hero, in the pre-Christian era, and was again demonstrated, in the seventeenth century, by the English mathematician Sir Isaac Newton.

The Helicopter was invented by the great Italian artist and inventor, Leonardo da Vinci, who designed and even built a model of a helicopter 400 years ago. That versatile genius was responsible for originating more devices than he could launch in his lifetime, and which we now take for granted as part of our everyday existence.

It's the same old story — There's nothing new under the sun, but a new application of an old idea will awaken people to the value of that idea.

Two or three years ago I was thrilled to learn that there was to be an auction in New York of 20,000 early American patent mod-

els, and for a number of reasons I was keenly interested. In the first place, having myself trod the thorny path of the inventor for over thirty years, I thought I could appreciate what a story of enthusiasm, hope, and often bitter disappointment those records could tell. Secondly, I saw in those models contributions of that American inventive genius to which the prosperity of this great country owes so much.

Having a profound admiration for these models, I tried to obtain some of them. My interest was intensified when I learned that the models to be auctioned included some from early inventors of New England, and particularly Rhode Island. Therefore, I was anxious to bring them back, if possible, where they belonged — that is to say, to the State of Rhode Island. Fortunately I was able to secure thirty-five of these early patent models, all of them invented by Rhode Islanders. Eight of these models, apart from their historical value, are of particular industrial interest to the State of Rhode Island, being closely identified with the great American textile industry, the cradle of which is Rhode Island. I brought these models to Rhode Island, repaired them, put them into working order, and awaited a suitable occasion for presenting them to their native State. I found such an occasion when, on December 13, 1944, the U.S. Alien Property Custodian exhibited alien patents in the Providence Public Library. At that time I had the honor of presenting to the State of Rhode Island these thirty-five historical models of early Rhode Island inventors, and they were graciously accepted by Governor J. Howard McGrath. They were placed on permanent exhibit, as an incentive to present and future Rhode Island inventors to contribute further to the progress of New England industry.

As I said a little while ago, almost all inventions have to suffer obscurity for a time and experience a rebirth before their value is recognized. I am certain, however, that this will not discourage inventors from continuing to strive for improvements in American industry, and especially for progress in New England. No amount of discouragement or disappointment — material or spiritual — can quench the spark when an inventor has faith and inner conviction in his idea — when he feels that he has something to offer which, in one way or another, will prove to be an advance in our civilization. Indeed, with the all-round acceleration which we, in our generation, have witnessed — especially in the last decade — inventors of today can surely hope that their aspirations will be reached much sooner than those of their predecessors. Whilst the pioneer spirit of New England is necessarily tempered with wise caution, there is today

a keener desire than ever, on the part of industry, to find new, forward-looking ideas. It is the men of vision who always have and always will form the real backbone of any nation's progress, and when that vision is supported by specialized training and the keen business sense for which New England is famous, satisfying rewards may be confidently expected.

The end of the war found New England eager to induce new, out-of-State industries to replace the mushroom growth of heavy war industries, and in Rhode Island the Industrial Commission made tremendous efforts to bring such industries to us here.

Such plants, however, although the location on the waterfront and waterways may look attractive for transportation and export, do not appear to me as suitable for New England. This region has no steel mills, nor coal mines, nor any of the basic requirements necessary to support a mass production program in competition with other, more favorably endowed regions.

I do see New England's successful future guaranteed by its traditional specialization in quality and skill, as proved so well in precision tooling, textile machinery, jewelry and similar industries. Adhering to this principle, New England industry will solve the difficult problem of successful competition with other industrial States in the Union.

Thank you.



*U.S.A. 1947*

Mr. Antoine Gazda at his desk in the laboratory  
of GAZDA ENGINEERING, Wakefield, R. I.

SPEAKER:

## Antoine Gazda

Mr. Antoine Gazda, a native of Austria, and flyer in the First World War, is well known for his armament and aviation inventions, and revolutionized aviation when he brought out the first jet propelled Helicopter three years ago.

Ten years ago, he warned the British Admiralty of the coming Nazi dive-bomber menace. To counteract this threat he initiated and developed with the Swiss Oerlikon Machine Tool Works in 1936, the now famous 20 mm. Oerlikon Anti-Aircraft Cannon, which he contributed first to the British war effort.

Two months before the event, he forecast to the British, the collapse of France and the French Army.

He forecast the London blitz with two-ton bombs. All the foregoing was skeptically received and considered, until unfortunately, proved to be true.

He immigrated to the United States in Spring 1940, where he organized in Rhode Island mass production of the 20 mm. Oerlikon A.A. Cannon for the British Admiralty. Shortly before Pearl Harbor the United States Navy accepted the 20 mm. Oerlikon as standard defense weapon against dive-bombers.

It was this 20 mm. Oerlikon Anti-aircraft Cannon which finally crushed the Axis dive-bombers and kamikaze.

During the San Francisco Conference — the result of which the world was awaiting with tension — he published a sensational article expressing his opinion that the Allied leaders of the Conference have evidently neglected to take the scientists into account in their plannings.

He pointed out that in any future conflict, an air force would be obsolete, and scientists will have more horrible weapons than the air force proved to be in the last war.

Only a few weeks after this, the first atomic bomb was dropped, and changed completely the security set-up of the San Francisco Conference.

Mr. Gazda, a member of the S.A.E. since 1928, is still engaged in armament research for defense weapons, although his principal interest is in the civilian aviation and automotive field in which he has had over thirty years experience.

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Next 35 Page(s) In Document Exempt



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